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U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE

ATTORNEY'S DOCKET NUMBER  
S1022/8152TRANSMITTAL LETTER TO THE UNITED STATES  
DESIGNATED/ELECTED OFFICE (DO/EO/US)  
CONCERNING A FILING UNDER 35 U.S.C. 371

U.S. APPLICATION NO. (If known, see 37 CFR 1.5)

09/194796

INTERNATIONAL APPLICATION NO.  
PCT/GB98/00956INTERNATIONAL FILING DATE  
31 March 1998 (31.03.98)PRIORITY DATE CLAIMED  
1 April 1997 (01/04/97)TITLE OF INVENTION A METHOD FOR REMOTELY CONTROLLING A PLURALITY OF APPARATUS USING A  
SINGLE REMOTE CONTROL DEVICE

APPLICANT(S) FOR DO/EO/US HULME, Peter John

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☐ This express request to begin national procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(1).
4. ☐ A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.
5. ☒ A copy of the International Application as filed (35 U.S.C. 371(c)(2)).
  - a. ☐ is transmitted herewith (required only if not transmitted by the International Bureau).
  - b. ☐ has been transmitted by the International Bureau.
  - c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US).
6. ☐ A translation of the International Application into English (35 U.S.C. 371(c)(2)).
- ☒ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3)).
  - a. ☒ are transmitted herewith (required only if not transmitted by the International Bureau).
  - b. ☐ have been transmitted by the International Bureau.
  - c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
  - d. ☐ have not been made and will not be made.
- ☐ A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
- ☒ An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).
- ☐ A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(C)(5)).

**Items 11. To 16. Below concern document(s) or information included:**

11. ☒ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
12. ☐ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
13. ☒ A FIRST preliminary amendment.  
☐ A SECOND or SUBSEQUENT preliminary amendment.
14. ☐ A substitute specification.
15. ☐ A change of power of attorney and/or address letter.
16. ☒ Other items or information: Copy of the Published PCT Application (WO 98/44647)

Express Mail Label No. EL056791225US  
Date Mailed: December 1, 1998

2 U.S. APPLICATION NO (If known, see 37 C.F.R. 1.5)	INTERNATIONAL APPLICATION PCT/GB98/00956	ATTORNEY'S DOCKET NUMBER S1022/8152
17. <input type="checkbox"/> The following fees are submitted:		CALCULATIONS PTO USE ONLY
<b>BASIC NATIONAL FEE (37 CFR 1.492(a)(1)-(5)):</b> Search Report has been prepared by the EPO or JPO ..... \$840.00  International preliminary examination fee paid to USPTO (37 CFR 1.482) ..... \$670.00 No international preliminary examination fee paid to USPTO (37 CFR 1.482) but international search fee paid to USPTO (37 CFR 1.445(a)(2)).. \$760.00  Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO..... \$970.00  International preliminary examination fee paid to USPTO (37 CFR 1.482) and all claims satisfied provisions of PCT Article 33(2)-(4) \$96.00  <b>ENTER APPROPRIATE BASIC FEE AMOUNT =</b>		<div style="border: 1px solid black; padding: 5px; min-height: 150px;"></div>
Surcharge of \$130.00 for furnishing the oath or declaration later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(e)).		\$ 840.00      \$ 0.00
CLAIMS	NUMBER FILED	NUMBER EXTRA
Total Claims	20 - 20 =	0
Independent Claims	2 - 3 =	0
MULTIPLE DEPENDENT CLAIM(S) (if applicable)		+ \$260.00
<b>TOTAL OF ABOVE CALCULATIONS =</b>		\$ 840.00
Reduction by 1/2 for filing by small entity, if applicable. Verified Small Entity Statement must also be filed (Note 37 CFR 1.9, 1.27, 1.28).		\$ 0.00
<b>SUBTOTAL =</b>		\$ 840.00
Processing fee of \$130.00 for furnishing the English translation later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(f)).		\$ 0.00
<b>TOTAL NATIONAL FEE =</b>		\$ 840.00
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate coversheet (37 CFR 3.28, 3.31). \$40.00 per property +		\$ 0.00
<b>TOTAL FEES ENCLOSED =</b>		\$ 840.00
		Amount to be: refunded \$
		charged \$
a. <input checked="" type="checkbox"/> A check in the amount of \$ 840.00 to cover the above fees is enclosed.  b. <input type="checkbox"/> Please charge my Deposit Account No. _____ In the amount of \$ _____ To cover the above fees. A duplicate copy of this sheet is enclosed.  c. <input checked="" type="checkbox"/> The commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 23/2825. A duplicate of this sheet is enclosed.		
<b>NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b) must be filed and granted to restore the application to pending status.</b>		
SEND ALL CORRESPONDENCE TO  WOLF, GREENFIELD & SACKS, P.C. 600 Atlantic Avenue Boston, Massachusetts 02210		<div style="border-bottom: 1px solid black; margin-bottom: 5px;"> </div> SIGNATURE  James H. Morris NAME  34,681 REGISTRATION NO

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ATTORNEY'S DOCKET NO.: S1022/8152

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Peter John HULME  
Serial No.: Unassigned  
Filed: Herewith  
For: A METHOD FOR REMOTELY CONTROLLING A PLURALITY OF  
APPARATUS USING A SINGLE REMOTE CONTROL DEVICE

Examiner: Unassigned  
Art Unit: Unassigned

Assistant Commissioner for Patents  
Washington, D.C. 20231

PRELIMINARY AMENDMENT

Sir/Madam:

Prior to examination, please amend the above-identified application as follows:

IN THE CLAIMS

Please rewrite claim 1 as shown below:

1. A method of controlling a first and second remote controlled apparatus, the first apparatus being [which is] operatively responsive to first control signals associated with [from] a first remote control device and signals from a broadcast medium, and the second apparatus being operatively responsive to second control signals associated with a second remote control device, [said] the method comprising the following steps:

- [- receiving said first control signals;
- receiving first reference control signals from a storage medium, said first reference control signals corresponding to said first control signals;
- comparing said first control signals and said first reference control signals; and

- operatively controlling said first apparatus in response to said first control signals when said first control signals and said first reference control signals equal each other; characterised in that, said method further comprises the following steps, which allows said first remote control device and said first apparatus to operatively control one or more second apparatus that are otherwise operatively responsive to respective second control signals from respective one or more second remote control devices:

- providing said first remote control device with additional operational functions, and corresponding third control signals, that respectively correspond to operational functions of said one or more second apparatus, said additional operational functions and third control signals being either selectively and/or permanently available;

- receiving and storing in said first apparatus, as part of an initialisation procedure and either in response to a request and/or as part of a predetermined sequence, said second control signals that have corresponding third control signals, said received second control signals being stored as second reference control signals in said storage medium;

- receiving said third control signals from said first remote control device;

- receiving second reference control signals from said storage medium;

- comparing said third control signals and said second reference control signals; and operatively controlling, by means of said second reference control signals, said one or more second apparatus, via said first apparatus, when said third control signals and said second reference control signals equal each other]

storing said second control signals in said first apparatus;

receiving the first control signals from the first remote control device at said first apparatus;

accessing said stored second control signals responsive to selected ones of said first control signals;

transmitting accessed second control signals to said second apparatus, wherein the first apparatus remotely controls the second apparatus responsive to selected ones of the first control signals from the first remote control device; and

receiving, at said first apparatus, signals from the broadcast medium which are transmitted to said second apparatus as second control signals to remotely control the second apparatus.

Please delete claims 2-22 without prejudice or disclaimer.

Please add the following new claims 23 - 40.

23. The method of claim 1, wherein said first apparatus remotely controls said one or more second apparatus.

24. A method according to claim 1, wherein said first apparatus is a set top box receiver.

25. A method according to claim 1, wherein said one or more second apparatus include a video recorder and a television.

26. A method according to claim 1, wherein said one or more second apparatus include a sound system.

27. A method according to claim 1, wherein said one or more second apparatus include home automation apparatus.

28. A method according to claim 1, wherein said second control signals are received in response to a request from said first apparatus from said one or more second remote control devices.

29. A method according to claim 1, wherein said second control signals are received as part of a predetermined sequence from a portable storage medium.

30. A method according to claim 29, wherein said portable storage medium is a smartcard.

31. A method according to claim 1, wherein second control signals are received as part of a predetermined sequence from the broadcast medium.

32. A remotely controlled apparatus, operatively responsive to first control signals and signals from a broadcast medium, comprising:

first receiving means for receiving said first control signals from a first remote control device and second receiving means for receiving said signals from the broadcast medium;

storage means for storing second control signals associated with a second remotely controlled apparatus operatively responsive to said second control signals;

control means for accessing said stored second control signals responsive to selected ones of said first control signals;

transmitting means for transmitting said accessed second control signals to said remotely controlled apparatus, whereby the remotely controlled apparatus remotely controls the second remotely controlled apparatus,

wherein the transmitting means is further operative to transmit said accessed signals from the broadcast medium to said remotely controlled apparatus as second control signals, to remotely control the second remotely controlled apparatus.

33. The remotely controlled apparatus of claim 32, wherein said control means stores said second control signals in said storage means.

34. The remotely controlled apparatus of claim 32, wherein said receiving means receives said second control signals from the second remote control device.

35. The remotely controlled apparatus of claim 34, wherein the storage means comprises a smart card.

36. A remote control system comprising:

a first remotely controlled apparatus operationally responsive to first control signals associated with a first remote control device and signals associated with a broadcast medium;

a second remotely controlled apparatus operatively responsive to second control signals associated with a second remote-control device, wherein said first apparatus transmits said second control signals, to remotely control the second apparatus, responsive to selected ones of said first control signals as selected by said second control signals; and

transmits said signals associated with the broadcast medium, to remotely control the second apparatus.

37. The remote control system of claim 36 wherein the first remotely controlled apparatus comprises:

first receiving means for receiving said first control signals from a first remote control device and second receiving means for receiving said signals from the broadcast medium;

storage means for storing second control signals associated with a second remotely controlled apparatus operatively responsive to said second control signals;

control means for accessing said stored second control signals responsive to selected ones of said first control signals;

transmitting means for transmitting said accessed second control signals to said remotely controlled apparatus, whereby the remotely controlled apparatus remotely controls the second remotely controlled apparatus,

wherein the transmitting means is further operative to transmit said accessed signals from the broadcast medium to said remotely controlled apparatus as second control signals, to remotely control the second remotely controlled apparatus.

38. The remote control system of claim 37, wherein said control means stores said second control signals in said storage means.

39. The remote control system of claim 37, wherein said receiving means receives said second control signals from the second remote control device.

40. The remote control system of claim 37, wherein the storage means comprises a smart card.

REMARKS

This is a preliminary amendment in which additional claims have been to this application for initial examination by the Examiner.

Favorable action is hereby earnestly solicited.

Respectfully submitted,

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Attorney's Docket No. S1022/8152

Dated: December 1, 1998



Title of The Invention

A METHOD FOR REMOTELY CONTROLLING A PLURALITY OF APPARATUS  
USING A SINGLE REMOTE CONTROL DEVICE

BACKGROUND OF THE INVENTION1. Field of the Invention

The present invention relates to a method for remotely controlling apparatus.

More particularly, the present invention relates to a method for remotely controlling a plurality of apparatus using a single remote control device.

2. Background Art

In relatively recent times, apparatus such as televisions sets (TV), video recorders (VCR), music centres (HiFi), "set top box" receivers (STB), etc. have been supplied with their own individual remote control devices. The manufacturers of such apparatus use different, and usually unique, sets of control signals or codes for controlling, via remote control devices, each of these apparatus. Therefore, someone who has, for example, a TV, VCR, HiFi and a STB would expect to have four remote control devices: i.e. one remote control device for each apparatus; especially if the apparatus originated from different manufacturers.

Apart from the practical problems of managing, and often juggling, a plurality of remote control devices, an economic problem arises in that each remote control device comes with its own component and assembly cost. This cost is hidden within the cost of the apparatus, and is carried by the consumer. Additionally, each remote control has to be powered: again at a cost to the consumer. Typically this involves mean having between four and eight batteries for four remote control devices. The ultimate disposal of this number of batteries,

multiplied by a nation of consumers having a plurality of remote control devices, impacts upon the environment as time progresses.

There are some suppliers that offer, for example, a TV and VCR as a set, which has a single, combined, remote control device that can be used to operate both the TV and the VCR. However, relatively speaking it is not often that such TV/VCR sets are bought, as they tend to be aimed at the high end of the consumer/business market. Therefore, the majority of TV/VCR combinations tend to be incompatible in terms of being controlled via a single remote control device. Therefore, the impact of such TV/VCR sets does very little to alleviate the practical, economic and environmental problems mentioned above. Attempts have been made in recent times to provide consumers with what are generally known as 'universal' remote control devices. The purpose of such a universal remote control device is to alleviate the aforementioned problems. However, there are also problems associated with these universal remote control devices. These problems can be summarised as follows.

For the universal remote control device to be truly universal, it must contain the control codes or signals that correspond to all apparatus available on the market. Apart from the practical and economic problems of a manufacturer of such universal remote control devices having to keep abreast of all emerging new codes, the universal remote control device would require a significant amount of memory to store all the various codes. Such memory is relatively expensive especially if this memory comes as a "stand-a-lone" memory. Furthermore, once a universal remote control device is sold it would have to be updated if it is to be at all effective for the future. Such an updateable universal remote control device would require relatively more expensive, programmable memory in addition to circuitry for receiving and processing new data relating to the new codes, and controlling a memory write operation.

It should be noted that the majority of present day remote control devices are optically based and operate in the infra-red band of the light spectrum. However, for the purposes of this document all previous and future reference to a remote control device is intended to include all types of current, and indeed future, remote control device such as acoustic and radio frequency (RF) remote control devices.

#### OBJECTS & SUMMARY OF THE INVENTION

Accordingly, an aim of the present invention is to overcome the aforementioned problems and attributable drawbacks associated with the current state of the art.

The present invention provides a method of controlling a first apparatus, which is operatively responsive to first control signals from a first remote control device, said method comprising the following steps: receiving said first control signals; receiving first reference control signals CR1 from a storage medium, said first reference control signals corresponding to said first control signals; comparing said first control signals and said first reference control signals; and operatively controlling, said first apparatus in response to said first control signals when said first control signals and said first reference control signals equal each other, characterised in that, said method further comprises the following steps, which allow said first remote control device and said first apparatus to operatively control one or more second apparatus that are otherwise operatively responsive to respective second control signals from respective one or more second remote control devices: providing said first remote control device with additional operational functions, and corresponding third control signals, that respectively correspond to operational functions of said one or more second apparatus, said additional operational functions and third control signals being either selectively and/or permanently available; receiving and storing in said first apparatus, as part of an initialisation procedure and either in response to

a request and/or as part of a predetermined sequence, said second control signals that have corresponding third control signals, said received second control signals being stored as second reference control signals in said storage medium; receiving said third control signals from said first remote control device; receiving second reference control signals from said storage medium; comparing said third control signals and said second reference control signals; and operatively controlling, by means of said second reference control signals, said one or more second apparatus, via said first apparatus, when said third control signals and said second reference control signals equal each other.

Said first apparatus may be a satellite and/or cable set top box, STB, receiver or a video recorder, VCR, or television, TV, and said one or more second apparatus may respectively include a video recorder and a television or a set top box receiver and a television or a set top box receiver and a video recorder.

Said storage medium may be a memory such as a ROM, EPROM, EEPROM, or flash memory. Said one or more second apparatus may include a sound system HiFi, for example a combined radio, cassette player and CD player.

Said one or more second apparatus may include home automation apparatus such as automatic blinds/shutters, light switching, security cameras etc.

Said second control signals may be received in response to a request from said first apparatus from said one or more second remote control devices.

Said second control signals may be received as part of a predetermined sequence from a portable storage medium. Said portable storage medium may be a smartcard or some other 'chip-carrying' medium.

Said second control signals may received as part of a predetermined sequence via said first apparatus's broadcast medium: the broadcast medium being, for example, a satellite dish receiver or a fibre optical cable and their respective associated hardware and system technologies.

The present invention provides a method for allowing a single apparatus, and its associated remote control device, to operatively control one or more other apparatus that are otherwise susceptible to being controlled by remote control signals.

The present invention thus provides a method for allowing a single apparatus, and its associated remote control device, to operatively control one or more other apparatus that are otherwise susceptible to being controlled by signals from their respective remote control devices.

The present invention provides a method for allowing a single apparatus, and its associated remote control device, to mimic or emulate the control signals of one or more other remote control devices so as to be able to operatively control the apparatus that would otherwise be controlled by the aforementioned other remote control devices.

According to the present invention there is provided a method for allowing practical, economical and environmental saving to be made by providing a method for allowing a single apparatus, and its associated remote control device, to operatively control one or more other apparatus that are otherwise susceptible to being controlled by signals from their respective remote control devices, i.e. providing a method for allowing a single apparatus, and its associated remote control device, to mimic or emulate the control signals of one or more other remote control devices so as to be able to operatively control the apparatus that would otherwise be controlled by the aforementioned other remote control devices.

The present invention provides a method for allowing a first apparatus to receive by interrogation, then store, remote control signals from one or more remote control devices, which are respectively associated with one or more second apparatus, in order that a single remote control device and its associated first apparatus can operatively control one or more second apparatus.

The present invention provides a method for allowing a first apparatus to receive then store remote control signals corresponding to those of one or more remote control devices, which are respectively associated with one or more second apparatus, in order that a single remote control device and its associated first apparatus can operatively control one or more second apparatus.

The invention also provides a method of controlling first and second remote controlled apparatus, the first apparatus being operatively responsive to first control signals associated with a first remote control device and the second apparatus being operatively responsive to second control signals associated with a second remote control device, the method comprising:

- storing said second control signals in said first apparatus;
- receiving the first control signals from the first remote control device at said first apparatus;
- accessing said stored second control signals responsive to selected ones of said first control signals; and
- transmitting said accessed second control signals to said second apparatus, wherein the first apparatus remotely controls the second apparatus responsive to selected ones of the first control signals from the first remote control device.

The invention further provides a remotely controlled apparatus, operatively responsive to first control signals, comprising:

- receiving means for receiving said first control signals from a first remote control device;

- storage means for storing second control signals associated with a second remotely controlled apparatus operatively responsive to said second control signals;

- control means for accessing said stored second control signals responsive to selected ones of said first control signals; and

- transmitting means for transmitting said accessed second control signals to said second remotely controlled apparatus, whereby the remotely controlled apparatus remotely controls the second remotely controlled apparatus.

Said control means may store said second control signals in said storage means.

The remotely controlled apparatus may further comprise broadcast receiving means for receiving broadcast signals, wherein said second control signals are received by said broadcast receiving means.

Said receiving means may receive said second control signals from the second remote control device.

The storage means may comprise a smart card.

The invention still further provides a remote control system comprising:

- a first remotely controlled apparatus operationally responsive to first control signals associated with a first remote control device;

- a second remotely controlled apparatus operatively responsive to second control signals associated with a second remote control device; wherein said first apparatus transmits said second control signals, to remotely control the second apparatus, responsive to selected ones of said first control signals.

The invention thus provides a remote control system in which

there are a plurality of remotely controlled devices associated with a respective plurality of remote control devices, each remote control device generating respective control signals, wherein one remotely controlled device remotely controls the other of the plurality of devices responsive to the control signals from the remote control device associated with the one remotely controlled device.

#### BRIEF DESCRIPTION OF THE DRAWINGS

These and other objects, as well as other advantages and features, of the present invention will become apparent in light of the following detailed description and accompanying drawings in which:

Figure 1 illustrates an embodiment of a typical system concept according to the present invention; and

Figure 2 illustrates an embodiment of a typical block diagram of circuitry within an apparatus according to the present invention.

#### DETAILED DESCRIPTION OF THE INVENTION

The following figures which illustrate the various embodiments of the present invention may incorporate the same or similar elements. Therefore, where the same or similar elements occur throughout the various figures, they will be designated in the same manner.

Figure 1 illustrates an embodiment of a typical system concept according to the present invention.

This system embodiment is illustrated as comprising a number of different apparatus, which include: a set-top-box receiver (STB) 10 for example a satellite set-top-box receiver, a video recorder (VCR) 20, a television set (TV) 30, and a sound system



(HiFi) 40.

The STB 10 receives, in the illustrated embodiment, signals via a satellite dish 45. Alternatively, the signals could be provided, via a cable, e.g. an optical cable, by a 'cable provider'. In the illustrated embodiment, the signals received by the satellite dish 45 are broadcast signals.

The STB 10 has a common operative connection(s), which could be a coaxial or scart cable for example, into the VCR 20 and the TV 30. The video is illustrated as having an operative cable connection(s) into the TV 30. The HiFi is illustrated as having no physical connection to either the STB 10, VCR 20 or TV 30. The arrangement of this illustrative embodiment of a system and its associated connections is known to those skilled in the art.

It should be noted that this embodiment could also include other apparatus, connected either physically or non-physically to the STB 10, such as home automation apparatus, for example automatic blinds, video security etc.

In this embodiment the STB 10 incorporates two blocks: a receiver block RX and a transmitter block TX. The overall system embodiment illustrates four remote control devices RC1-RC4. The latter three remote control devices RC2-RC3 are represented by dashed-line rectangles. The remote control devices RC2-RC4 are respectively associated with the VCR 20, TV 30, and HiFi 40. The remote control devices RC2,RC3,RC4 generate respective control signals CS2,CS3,CS4 to control the respective apparatus VCR 20, TV 30, HiFi 40. Each of the VCR 20, TV 30 and HiFi 40 include a receiver block RX for receiving the respective control signals. The receiver block RX of the STB 10 receives, as it would in the state of the art, control signals CS1 from the remote control device RC1.

According to one embodiment of the present invention, the STB

10 is capable of receiving (i.e. downloading), via the receiver block RX, and processing, respective control signals CS2-CS4 from the remote control devices RC2-RC4 that are respectively associated with the apparatus 20, 30 and 40.

According to another embodiment of the present invention, the STB 10 receives (i.e. download) the respective control signals CS2-CS4 associated with the remote control devices RC2-RC4 via a smart card, or another suitable medium, that is input to the STB 10 and/or via the satellite dish 45 or optical cable. Being able to download from a smartcard or from the broadcast signals, for example, has the advantage of not having to have the remote control devices RC2-RC4.

Also according to the present invention, the transmitter block TX of the STB 10 transmits control signals CS5 that are used to control the other apparatus 20, 30 and 40. Alternatively, the STB could control the other physically connected apparatus 20 and 30 via the cable.

It should be noted that in this particular arrangement, the STB 10 is illustrated as controlling the other apparatus 20, 30 and 40. However, the arrangement could be adapted such that any one of the other apparatus, such as the VCR 20 or the TV 30 for example, is used to control the other apparatus.

Figure 2 illustrates an embodiment of a typical block diagram of circuitry incorporated within the STB 10 apparatus according to the present invention. As mentioned hereinabove, this circuitry may alternatively be incorporated in other parts of the apparatus in the system.

This block diagram is illustrated as comprising: the receiver block RX; a microcontroller  $\mu C$ , a memory MEM; and the transmitter block TX.

According to one embodiment of the present invention the STB

10 is capable of receiving (i.e. downloading) via the receiver block RX, and processing, the respective control signals CS2-CS4 from the remote control devices RC2-RC4.

In this particular embodiment, the user initiates a software program within the STB 10 that allows the remote control devices RC2-RC4 to be interrogated. As a result of the interrogation, the remote control signals CS2-CS4 or codes associated with the other apparatus 20,30,40 are stored in a memory device preferably the memory MEM within the STB 10. The memory device may be, for example ROM, EPROM, EEPROM, flash memory etc. The remote control codes CS2-CS4 received from the remote control devices RC2-RC4 are operatively stored such that they correspond to known, or defined, respectively different remote control codes that are associated with the remote control device RC1. An important point to note is that the remote control signals CS1 of RC1 that correspond to the respective remote control signals CS2-CS4 from RC2-RC4 have to have the same associated functions: therefore when the "record" button on remote control device RC1 is pressed, the VCR 20 responds and records, and does not perform a different operation such as eject a tape.

The software program for carrying out the interrogation could be initiated either from the remote control device RC1 or by pressing a button(s) on the STB 10.

In this embodiment, the microcontroller  $\mu$ C of the STB 10 outwardly interfaces with the user, via the coax/scart connection(s), using the TV 30 for example.

The first issue to be addressed by the software program is to identify the type of apparatus the remote control codes CS2-CS4 associated with the remote control devices RC2-RC4 control. The software program for carrying out the interrogation may give the user a choice of options, via the TV 30 for example, from a predetermined list. Alternatively, the user could

interface with the STB 10 so as to enter a non-specified apparatus, and even non-specified functions, using the keypad of the remote control device RC1, such interface techniques are known to those skilled in the art.

It should be noted that the remote control device RC1 requires a keypad arrangement and control sequence that allowed it to work in various modes. For example, in a first, STB, mode M1, only those buttons, or button sequences, relating to the STB 10 functions would output corresponding remote control signals or codes for operating the STB 10. In a second, VCR, mode M2, only those buttons, or button sequences, relating to the VCR 20 functions would output corresponding remote control signals for operating the VCR 20, and so on. These various modes M1, M2, ... Mn etc, could be selected by pressing an appropriate button, or sequence of buttons, on RC1. In this example of distinct modes M1, M2, ... Mn etc, either the remote control device may add some distinguishing element to each transmitted remote control signal(s) or alternatively, RC1 may send a signal(s) to the STB 10 that sets up the STB 10 for the corresponding required mode.

Alternatively, there could be mixed-mode functioning. Mixed-mode functioning would be possible when in one mode, a function that was unique to another mode, i.e. another apparatus, was selected. For example, when in mode M1, a button on RC1 is pressed that corresponded to the VCR 'record' function. Since this 'record' function is unique to the VCR 20 then the need to enter into mode M2 is no longer necessary. In mixed-mode functioning, the need to enter into a particular mode would only be necessary when there is a button(s), or sequence of buttons, that are common to two or more apparatus, examples being numbers 0, 1, 2 ... n, volume +/-, channel +/- etc. It should also be noted that the remote control signals relating to the STB 10 apparatus will already be stored as reference remote control signals in the memory MEM associated with the microcontroller  $\mu$ C.

If, in this particular embodiment, the user selected an apparatus, for example a VCR 20, from a predetermined list of apparatus held within the memory MEM of the STB 10, then the STB 10 enters a software routine under the control of the "interrogation" software program. This routine requests, from another predetermined list, the user to press a sequence of buttons on remote control device RC2 etc. that corresponds to each of the various requests, i.e. the various functions associated with the VCR 20 etc. and each of the various requests would have a corresponding reference remote control signal that is associated with RC1. There could also be the option of the user defining functions that the STB 10 does not recognise and the user and/or microcontroller  $\mu$ C assigning a corresponding RC1 reference remote control signal.

In an example of setting up a VCR 20, the remote control signals CS2 transmitted by the VCR 20 remote control device RC2 are received by the receiver block RX of the STB, passed onto the microcontroller  $\mu$ C and then operatively stored in a memory location of the memory MEM as VCR reference remote control signals or codes along with associated remote control device RC1 reference remote control signals. For example, assume that the remote control signal from RC2 relating to the VCR's 'record' function was the four bit binary number 0110 and the corresponding remote control signal from RC1 relating to a VCR's 'record' function was the four bit binary number 1001: it should be noted that the codes from RC1 would have to be different from any of the codes associated with the other apparatus in order to avoid 'operational interference'. The binary number 1001 would already be stored in the memory MEM of the STB assuming it is predefined. Then, under control of the "interrogation" software program, it would be associated with the memory location of the binary number 0110 of the corresponding function, which would be stored in a different memory location. Therefore, the binary number 1001 would have a 'memory map' reference to the binary number 0110.

Having set up the memory MEM with the various reference remote control signals associated with the other apparatus and cross referencing them to corresponding remote control device RC1 reference control signals, during normal operation every time a remote control signal is received from remote control device RC1 by the microcontroller  $\mu C$ , via the receiver block RX of the STB the microcontroller  $\mu C$  compares this received remote control signal CS1 with the remote control device RC1 reference remote control signals stored in the memory MEM.

The remote control device RC1 may pause after each control signal CS1 associated with either the VCR, TV or HiFi to enable the transmitter block TX in the STB to send the appropriate control signals CS2, CS3 or CS4.

When the microcontroller  $\mu C$  identifies a remote control signal from remote control device RC1 that corresponds to a RC1 reference remote control signal it must firstly determine if the received signals or codes are associated with the STB 10 or with other apparatus. If the remote control signals received from remote control device RC1 are associated with the STB 10 then the microcontroller of the STB 10 is operated in accordance with the received signals or codes. If the RC1 received remote control signals are not associated with the STB 10 then the microcontroller of the STB 10 has to retrieve, from memory MEM, the stored remote control signals or codes to which the RC1 received signals or codes correspond. The microcontroller  $\mu C$  then outputs, via the transmitter block TX of the STB, the non-RC1 reference remote control signals or codes that correspond to the received and stored RC1 remote control signals or codes, which operatively controls the corresponding apparatus.

The receiver blocks RX may typically be a light sensitive semiconductor device that is capable of receiving signals, CS1-CS4 and CS5, in the infra-red part of the light spectrum since most remotely controlled apparatus use infra-red receivers and

transmitters. Alternatively, a receiver that was capable of receiving electrical or electro-magnetic signals or codes could be employed. Another example of a receiver block RX is a modem that is capable of receiving signals superimposed on the mains electricity supply of a household.

Likewise, the transmitter block TX of the STB would typically be a light emitting semiconductor device that is capable of transmitting signals, CS5, in the infra-red part of the light spectrum. Alternatively, a transmitter that is capable of transmitting electrical or electro-magnetic signals or codes could be employed. Another example of a transmitter block TX is a modem that is capable of transmitting signals superimposed upon the mains electricity supply of a household.

It should be noted that there could also be a plurality of different types of receivers and transmitters within an apparatus.

In a preferred embodiment of the current invention, the remote control signals corresponding to a particular apparatus could be input, or downloaded, via a smart card or via the broadcast medium, neither of which are illustrated.

The advantages of such an embodiment means that there is no longer a requirement for more than one remote control device. Therefore, all the disadvantages, such as cost and battery disposal, that is associated with a plurality of remote control devices would be alleviated. However, the former embodiment would serve well in the transitional period to this preferred embodiment.

In the case of the smartcard, the manufacturers of an apparatus would supply, with the apparatus, a smartcard that contained all of the remote control codes that are associated with the particular apparatus, or even a manufacturers range of apparatus. The advantages of smartcards are known and include

portability, programming flexibility, recyclability and low cost.

The 'master' apparatus in the example given above was the STB 10, but alternatively could be any of the other apparatus 20, 30 or 40. The 'master' apparatus may incorporate a smartcard reader and software that is operatively capable of extracting from the smartcard the remote control signals or codes associated with the 'slave' apparatus, for example a VCR 20, and storing and cross referencing such.

In the case of the broadcast medium, the remote control signals associated with various apparatus could be transmitted in the same or a similar manner as teletext, or even on a dedicated channel. The user could then, for example, select from a predefined list the type of 'slave' apparatus that is required to be controlled and then the 'master' device could automatically and operatively download, store and cross reference the remote control signals or codes associated with the particular 'slave' apparatus.

It should be noted that the arrangement, control and design of the various apparatus and the remote control device, and their interaction, embraces many fields, principles and techniques that are far too numerous and diverse to cover in any great detail in this document. Generally, for example, a system or protocol has to be set up such that the remote control signals are all read or downloaded, stored and cross referenced in a predetermined manner such that they have a corresponding, known, reference as to what their associated function and apparatus is; a protocol for selecting the 'master' and 'slave' devices would need to be established, since the inventor envisages that there will be at least some key apparatus, such as STB 10, VCR 20 and TV 30 that will all have the possibility of being 'master' apparatus. The design, layout and control of the remote control device has to take in a number of factors such as ease of use, the ability to control a plurality of



apparatus, and the possibility of defining whether 'custom' apparatus and functions can be added etc.

Such fields, principles and techniques and requirements to exploit the present invention will be apparent to those skilled in the art in light of this disclosure embodying the present invention.

Although this invention has been described in connection with certain preferred embodiments, and generalised, it should be understood that the present disclosure is to be considered as an exemplification of the principles of the invention and that there is no intention of limiting the invention to the disclosed embodiments. On the contrary, it is intended that all alternatives, modifications and equivalent arrangements as may be included within the scope of the appended claims be covered as part of this invention.

## Claims

1. A method of controlling a first apparatus, which is operatively responsive to first control signals from a first remote control device, said method comprising the following steps:

- receiving said first control signals;
- receiving first reference control signals from a storage medium, said first reference control signals corresponding to said first control signals;
- comparing said first control signals and said first reference control signals; and

- operatively controlling said first apparatus in response to said first control signals when said first control signals and said first reference control signals equal each other;

characterised in that,

said method further comprises the following steps, which allows said first remote control device and said first apparatus to operatively control one or more second apparatus that are otherwise operatively responsive to respective second control signals from respective one or more second remote control devices:

- providing said first remote control device with additional operational functions, and corresponding third control signals, that respectively correspond to operational functions of said one or more second apparatus, said additional operational functions and third control signals being either selectively and/or permanently available;
- receiving and storing in said first apparatus, as part of an initialisation procedure and either in response to a request and/or as part of a predetermined sequence, said second control signals that have corresponding third control signals, said received second control signals being stored as second reference control signals in said storage medium;
- receiving said third control signals from said first remote control device;
- receiving second reference control signals from said storage

medium;

- comparing said third control signals and said second reference control signals; and
- operatively controlling, by means of said second reference control signals, said one or more second apparatus, via said first apparatus, when said third control signals and said second reference control signals equal each other.

2. The method of claim 1, wherein said first apparatus remotely controls said one or more second apparatus.

3. A method according to claim 1 or claim 2, characterised in that said first apparatus is a set top box receiver.

4. A method according to any one of claims 1 to 3, characterised in that said one or more second apparatus include a video recorder and a television.

5. A method according to any one of claims 1 to 4, characterised in that said first apparatus is a video recorder.

6. A method according to any one of claims 1 to 5, characterised in that said one or more second apparatus include a set top box receiver and a television.

7. A method according to any one of claims 1 to 6, characterised in that said first apparatus is a television.

8. A method according to any one of claims 1 to 7, characterised in that said one or more second apparatus include a set top box receiver and a video recorder.

9. A method according to any of claims 1 to 8, characterised in that said one or more second apparatus include a sound system.

10. A method according to any of claims 1 to 9, characterised in that said one or more second apparatus include home automation apparatus.

11. A method according to any of claims 1 to 10, characterised in that said second control signals are received in response to a request from said first apparatus from said one or more second remote control devices.

12. A method according to any of claims 1 to 10, characterised in that said second control signals are received as part of a predetermined sequence from a portable storage medium.

13. A method according to claim 12, characterised in that said portable storage medium is a smartcard.

14. A method according to any of claims 1 to 10, characterised in that said second control signals are received as part of a predetermined sequence via said first apparatus's broadcast medium.

15. A method of controlling first and second remote controlled apparatus, the first apparatus being operatively responsive to first control signals associated with a first remote control device and the second apparatus being operatively responsive to second control signals associated with a second remote control device, the method comprising:

- storing said second control signals in said first apparatus;
- receiving the first control signals from the first remote control device at said first apparatus;
- accessing said stored second control signals responsive to selected ones of said first control signals; and
- transmitting said accessed second control signals to said second apparatus, wherein the first apparatus remotely controls the second apparatus responsive to selected ones of the first control signals from the first remote control device.

16. A remotely controlled apparatus, operatively responsive to first control signals, comprising:

- receiving means for receiving said first control signals from a first remote control device;
- storage means for storing second control signals associated with a second remotely controlled apparatus operatively responsive to said second control signals;
- control means for accessing said stored second control signals responsive to selected ones of said first control signals; and
- transmitting means for transmitting said accessed second control signals to said second remotely controlled apparatus, whereby the remotely controlled apparatus remotely controls the second remotely controlled apparatus.

17. The remotely controlled apparatus of claim 16, wherein said control means stores said second control signals in said storage means.

18. The remotely controlled apparatus of claim 16 or claim 17, further comprising:

- broadcast receiving means for receiving broadcast signals, wherein said second control signals are received by said broadcast receiving means.

19. The remotely controlled apparatus of claim 16 or claim 17, wherein said receiving means receives said second control signals from the second remote control device.

20. The remotely controlled apparatus of claim 14 wherein the storage means comprises a smart card.

21. A remote control system comprising:

- a first remotely controlled apparatus operationally responsive to first control signals associated with a first remote control device;
- a second remotely controlled apparatus operatively

responsive to second control signals associated with a second remote control device; wherein said first apparatus transmits said second control signals, to remotely control the second apparatus, responsive to selected ones of said first control signals.

22. The remote control system of claim 21 in which the first remotely controlled apparatus comprises the remotely controlled apparatus of any one of claims 16 to 20.

ABSTRACT

A METHOD FOR REMOTELY CONTROLLING A PLURALITY OF APPARATUS  
USING A SINGLE REMOTE CONTROL DEVICE

The present invention relates to a method of controlling one or more second apparatus from a first apparatus, which is responsive to first control signals from a first remote control device. The characteristic steps of the method comprising: providing the first remote control with additional operational functions, and corresponding third control signals, that correspond to functions of said second apparatus; receiving and storing in said first apparatus, as part of an initialisation procedure second control signals that have corresponding third control signals, said second control signals being stored as second reference control signals in a storage medium; receiving said third control signals from said first remote control; receiving said second reference control signals from said storage medium; comparing said third control signals and said second reference control signals; and controlling, by means of said second reference control signals, said second apparatus, via said first apparatus, when said third control signals and said second reference control signals equal each other.

Figure 1.

Figure 1

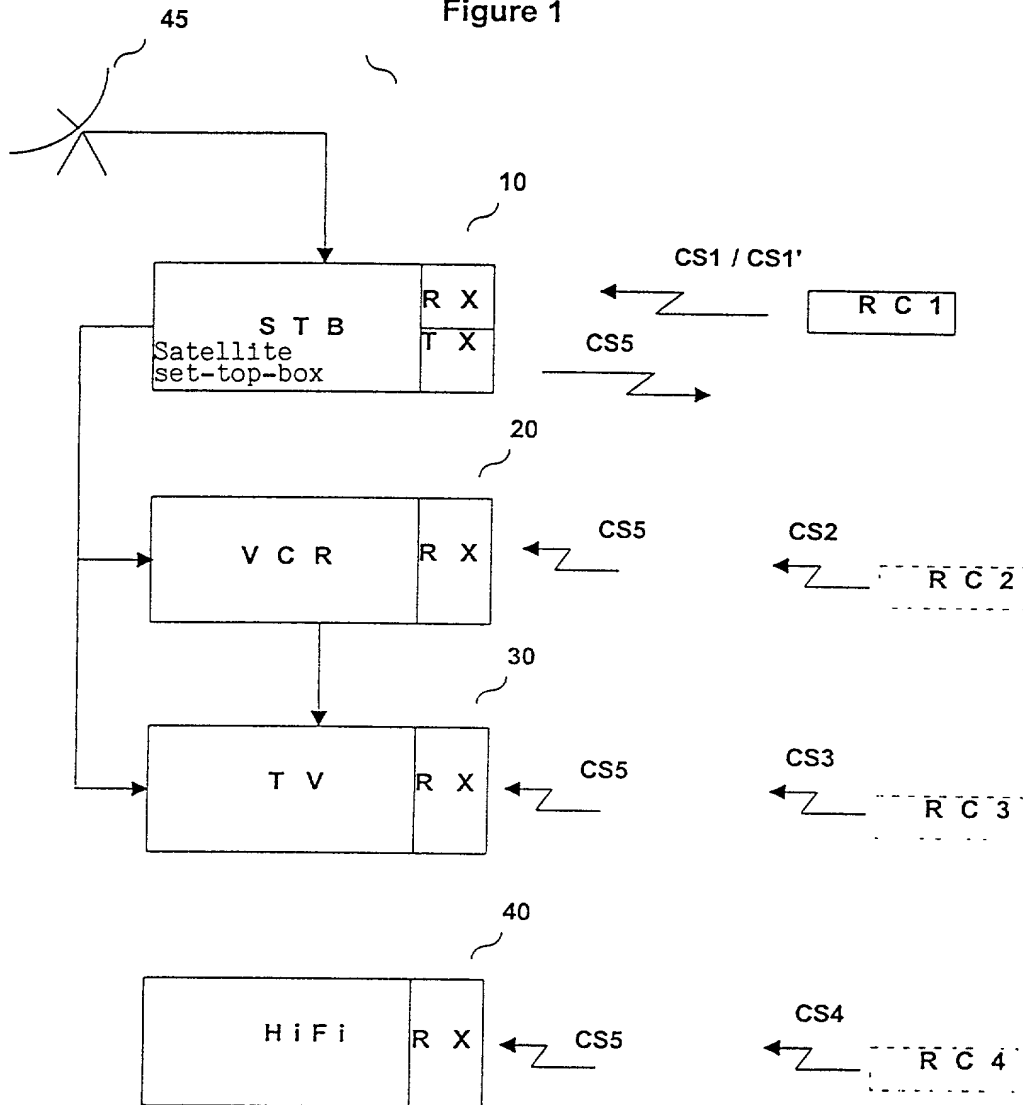
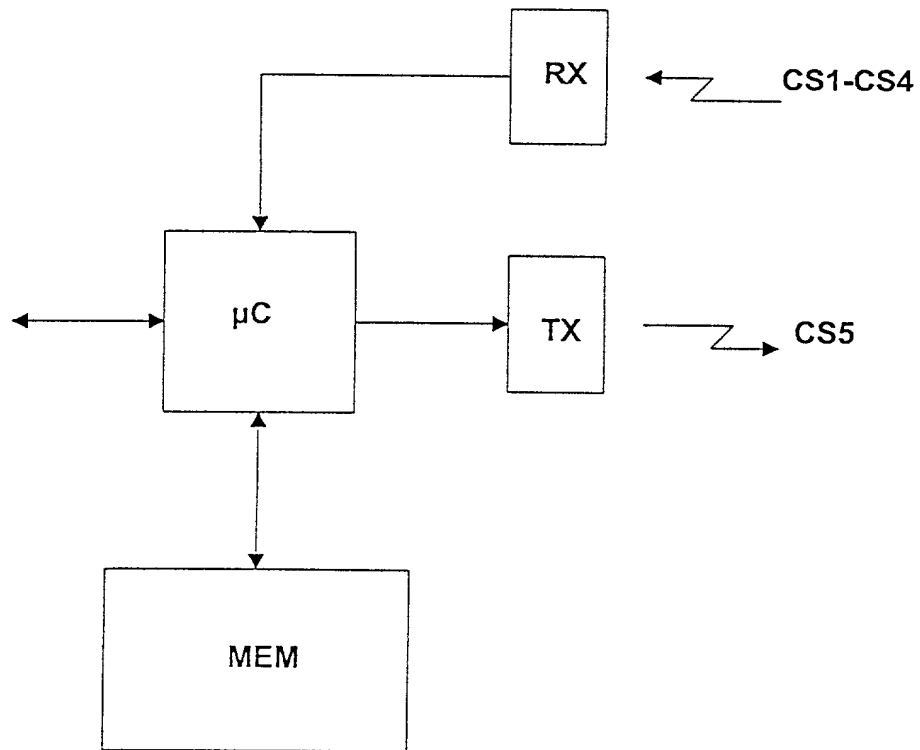




Figure 2



Attorney's Docket No. S1022/8152

**DECLARATION FOR PATENT APPLICATION**

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled A METHOD FOR REMOTELY CONTROLLING A PLURALITY OF APPARATUS USING A SINGLE REMOTE CONTROL DEVICE the specification of which is attached hereto.

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, §1.56.

I hereby claim foreign priority benefits under Title 35, United States Code, §119(a)-(d) or §365 (b) of any foreign application(s) for patent or inventor's certificate, or section 365(a) of any PCT International application designating at least one country other than the United States listed below and have also identified below any foreign application for patent or inventor's certificate or PCT International application having a filing date before that of the application on which priority is claimed:

Prior Foreign PCT International Application(s) and any priority claims under 35 U.S.C. §§119 and 365(a),(b):

<u>9706620.3</u>	<u>United Kingdom</u>	<u>1 April 1997 (01.04.97)</u>	Priority
(Number)	(Country-if PCT, so indicate)	(DD/MM/YY Filed)	Claimed
			<input checked="" type="checkbox"/> <input type="checkbox"/>
			YES NO
<u>                    </u>	<u>                    </u>	<u>                    </u>	<input type="checkbox"/> <input type="checkbox"/>
(Number)	(Country)	(DD/MM/YY Filed)	YES NO
<u>                    </u>	<u>                    </u>	<u>                    </u>	<input type="checkbox"/> <input type="checkbox"/>
(Number)	(Country)	(DD/MM/YY Filed)	YES NO

I am the inventor of United Kingdom application number 9706620.3, filed April 1, 1997, which application was filed by the assignee SGS-Thomson Microelectronics, Limited.

I hereby claim the benefit under Title 35, United States Code, §119(e) of any United States provisional application(s) listed below:

<u>                                    </u>	<u>                                    </u>
(Application Number)	(filing date)
<u>                                    </u>	<u>                                    </u>
(Application Number)	(filing date)

I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s), or §365(c) of any PCT International application(s) designating the United States of America listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application in the manner provided by the first paragraph of Title 35, United States Code, §112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, §1.56 which became available between the filing date of the prior application and the national or PCT International filing date of this application:

(Application No.)	(filing date)	(status-patented, pending, abandoned)
(Application No.)	(filing date)	(status-patented, pending, abandoned)

PCT International Applications designating the United States:

PCT/GB 98/00956 31 March 1998 (31.03.98) Pending  
(PCT Appl. No.) (U.S. Ser. No.) (PCT filing date) (status-patented, pending, abandoned)

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I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

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